

PAPERS READ.

On some Australian Shells, described by Dr. A. Gould, by the Rev. J. E. TENISON-WOODS, F.G.S., &c., Cor. Mem. Lin. Soc., N. S. W.; of the Roy. Soc., Tas.; and Hon. Memb. Roy. Soc., N. S. W., &c.

Many Australian Naturalists have no doubt been puzzled, as I have often been, to find the name of Gould as a reference after some Australian Mollusca, and though it is generally known that it is the name of an American conchologist, yet few have been able to compare any of his descriptions. As the works he wrote are extremely numerous and for the most part scattered through various American publications, I thought it might be a useful work to bring together, as far as they were accessible to me, all his descriptions of Australian species. They were for the most part contained in the Proceedings of the Boston Society of Natural History, but were continued through several volumes. I am not aware of any copy of this publication except in the Melbourne Public Library, and I availed myself of a visit to Melbourne last year to copy all the Australian references. This was done for my own use, but I think I shall be rendering a service to my scientific brethren and to the public, by publishing my notes, together with such information as I have been able to gather of the Australian species described by Dr. Gould, and of his own life and labours.

He was born at New Ipswich, in the United States (New Hampshire County), on the 23rd April, 1805, and entered the American Cambridge University in 1821. After some time he was appointed a tutor in the same college, and having chosen the medical profession he became house student in the Massachusetts General Hospital. He graduated in 1830. From his youth he had manifested extraordinary industry, with a great taste for Natural History. Both these qualities were exhibited in his first work, which was a Monograph of the Cicindelæ of Massachusetts, published in 1834. This was quickly followed by a classified catalogue of 50,000 pamphlets in the collection of the

Boston Athenæum. From that time forward his tastes and studies took a decided turn for Conchology, and it would be a long work to attempt to give a list of the various essays, papers and work put forth by him on that subject during the rest of his extraordinarily active and useful life. In 1848 he was associated with the elder Agassiz in preparing a work on the principles of Zoology, and for many years issued certain essays of great value in his particular department of science named *Otia Conchologica*.

In 1846 he was employed by the American Government to report upon the shells collected in the U. S. Exploring Expedition under Commodore Wilkes. This task was not completed for some years and was continued in the Proceedings of the Boston Society of Natural History through many volumes. The eminent career of this zealous scientific labourer was cut short in a very unexpected manner. Dr. Augustus A. Gould died of cholera, in Boston, after an illness of only 15 hours, on September 15, 1866, at the age of 61.

The following is a collection of all the descriptions of Australian Shells named by him. *Proc. Bost. Soc. Nat. Hist.*, vol II., p. 142.

CHITON QUERCINUS.

T. depressa, ovalis, vix carinata, QUERCINA, maculis olivaceis nebeculata, valvis subrostratis, areis lateralibus vix elevatis, longitudinaliter, sulcatis, sulcis incumbentibus et sulco radiante bisectis, areis centralibus ad latera lineis rugosis longitudinaliter sculptis, ad dorsum punctatis; valva anteriori sulcis concentricis et sulcis radiantibus remotioribus decussata; valva posteriori prope marginem umbonata, margine lato, pumicoso, flavescente. Long. $\frac{7}{8}$, lat. $\frac{3}{8}$ poll. Hab. N. S. Wales.

Allied to *C. foveolatus* Sowerby.

CHITON JUGOSIS.

T. ovalis, carinata, tectiformis, nitida, coloribus pallide et saturate herbeis variegata, valvis planulatis, ad apices adunco acuminatis, areis lateralibus prominentibus et lineolis confertis

parallela viridibus longitudinaliter notatis, areis centralibus sulcis acutis parallelis longitudinaliter aratis, sed ad verticem simplicibus et minutissime punctatis, valva anteriori concentricè lineolata, valva posteriori umbonata, prope marginem concentricè lineolata præter aream terminalem luteolam, margine granulato, fasciis cæruleis et viridibus limbo, intus pallide virescens. Long. 1, lat. $\frac{3}{8}$ poll. *Hab.* N. S. Wales.

Resembles *C. siculus*, which, however, has radiating lines on the lateral areas.

CHITON FRUTICOSUS.

T. ovalis, valde elongata, transversim arcuata, omnino textiliter punctata, olivacea, maculis minutis, saturatoribus fulgurantibus variegata, valvis haud rostratis, areis lateralibus prominentibus et lineis elevatis interruptis ramosis, radiatis, areis centralibus lineis longitudinalibus rugosis ad latera profundis, ad dorsum evanidis et arcuatis sculptis, area posteriori magna, umbonata, lineis inconspicuis interdum divaricatis radiata, intus flavo-olivacea, ligamentum latum, pallidum minutissime granulatum. Long. $1\frac{1}{2}$, lat. $\frac{5}{8}$ poll. *Hab.* N. S. Wales.

Resembles fig. 6 of Sowerby's Conchological Illustrations, which is said to be a variety of *C. indicus*, but which has no ramose structure on the lateral areas.

CHITON PLATESSA.

T. parva, tenuis, elongato ovalis, transversim arcuata, citrino olivacea, ubique minutissime punctata, areis lateralibus parvis, vix elevatis, lineis 2-3 inconspicuis, striatis, areis centralibus lineis confertis acutis, granulatis arcuatim decussatis; valva postica magna, obscure radiata, margine virente, fusco tessellato, minutissime granulato, intus cæruleo virescens. Long. $\frac{7}{8}$, lat. $\frac{9}{20}$ poll. *Hab.* N. S. Wales.

Similar in its general aspect to *C. fruticosus*, but smaller, smoother, and the sculpture of the lateral areas and terminal valves entirely different. It is almost exactly like fig. 67 of the Conchological Illustrations.

[The shell referred to is *C. pusillus*, Sow., S. America, our *Chiton Australis*, Lam. not. Sow. J. E. T. W.]

CHITON INCANUS.

T. solida, oblongo ovalis, valde convexa, cinereo et nigro variegatæ concentricè undulato striata, granulis sparsis nigris aspersa, a dorsum subcarinata et longitudinaliter nigro bifasciata; arcibus lateralibus viæ distinctis, margine aculeis inequalibus curtis, curvatis nigris et canescentibus induta. Long. $\frac{1}{10}$, lat. $\frac{3}{4}$ poll. Hab. N.S. Wales.

Like *C. piceus*, Gray, and still more like *C. petholatus*, which has a hairy margin.

(Page 151.)—PATELLA CINNAMONEA.

T. ovalis, parva, convexa, tenuis, cinnamonea, cum striis radiantibus, tenuibus, confertissimis imbricato asperis; apice acuto, antico, ad marginem valde declinato; apertura margine anterior excurvato, intus costa alba marginali minuta. Long. $\frac{1}{2}$, lat. $\frac{3}{8}$, alt. $\frac{9}{40}$ poll. Hab. N. S. Wales.

Closely allied to *P. galathea*, Lamarek, which, however, is snow white, more circular, the apex more central, and the striæ much coarser.

[This diagnosis is obscurely brief, but appears to refer to a *Siphonaria*.—J. E. T. W.]

HALIOTIS CRISPATA.

T. parva, tenuis, convexa, elongato ovalis, undulis obliquis, angulatis, divaricantibus rugata, spiraliter striata, rubida; spira elevata, submediano, foraminibus parvis, circularibus, confertis, ad septennis perviis, extrorsum canaliculatis, intus undulosa, nitida argentea. Long. $1\frac{2}{3}$, lat. $\frac{7}{8}$ poll.

With N. Holland shells. About the size and form of *H. stomaticæ-formis*, Reeve, but distinguished from all others by its crowded angular ripples arranged somewhat like the colors of *H. ziczac*. No shell approaches it in this respect, except the very young of *H. australis*.

[Very probably a young variety of *H. nævosa*, of which *H. australis* is a synonym. In the shape and the undulations referred to that species is extremely variable. J. E. T. W.]

(Vol. 3, Proceedings Boston Soc., Nat. Hist., p. 74, on the shells of Commander Wilkes' Exploring Expedition.)

AMNICOLA BADIA.

T. minuta elongata, ovata, turrata, badia, spira acuta, apicerosa; anfr. 5, convexiusculus, ultimo vix angulato, sutura impressa, apertura ovata, peristomate continuo, obtuso, fusco. Long. $\frac{1}{3}$, lat. $\frac{1}{12}$, poll. *Hab.* Banks' Peninsula, New Zealand.

A small elongated species, like *A. Preissii* of N. Holland. Its color and its dark obtuse peristome give rather a marked character to a shell so small and simple.

[Appears to resemble the minute genus so common in the freshwater lakes and streams of Australia and Tasmania, and which is variously named *Paludestrina*, *Bythinia*, *Hydrobia*, *Bythinella*, and *Amnicola*. I am of opinion that this shell has been redescribed in the Zoological Proceedings as *Paludestrina saleana* by M. Fischer. J. E. T. W.]

AMNICOLA EGENA.

T. minuta, tenuis, subperforata, elongato-turrata, epidermide virescente induta; spira acuta; anfr. 5, convexis, sutura profunda, apertura ovata, peristomate continuo, labro acuto, patente. Long. $\frac{1}{5}$, lat. $\frac{1}{10}$, poll. *Hab.* Banks' Peninsula, New Zealand.

More slender and less solid than *A. badia*, and of an entirely different color. It is very much like *Paludina acuta* of Europe.

(Vol. 3, loc. cit. p. 90.)—TROCHUS SIRIUS.

T. parva, imperforata, pyramidata, dilute beryllina, leviter corrugata; spira anfr. 4, conicis, infra oblique plicatis, ad peripheriam acutis et spinis compressis ad 18, armatis; basi planulata, stellaris, liris concentricis muricatis ad 5 insculptis; regione collumellari arcuata, levigata, labro peroblique. Diam. $\frac{1}{2}$, axis $\frac{3}{10}$, poll. *Hab.* N. Holland.

The multitude and regularity of the triangular projections of the periphery when viewed from below give the base a beautiful star-like form, much like *T. stellaris*.

[This is only a young form of *Carinidea squamifera*, which has the projections at the periphery, though it loses them in the adult state. The operculum is completed very early. J. E. T. W.]

(P. 254.)—*PSAMMOBIA FLORIDA*.

T. transversa oblonga, tenera, polita, purpurascens, postice albo radiato, limbo epidermide flavo virescente induto, natibus postmedianis, inconspicuis, latere antico semi-elliptico, apice submediano, latere siphonali angustato, acule rotundato apice inframediano, margine ventrali rectiusculo, interior incarnata, sinu siphonali angusto prælongo; cardine dentibus duobus minutis, divaricantibus in utraque valva instructo. Long. $1\frac{1}{4}$, alt. $\frac{7}{10}$, poll. Hab. Illawarra, N. S. Wales.

A shell closely resembling in structure and exterior coloring *Machæra costata*. It has the form of *P. vespertina*, except that the beaks are removed much further backwards.

[A very distinct species, but rare in Port Jackson and on the East Coast.—J. E. T. W.]

(Loc. cit. p. 292.)—*CYCLAS EGREGIA*.

T. ventricosa transversa oblonga, subæquilateralis, concentricè tenue lirata, umbonibus parum elevatis, tumidis, epidermide viridicorneo, fusco zonato, plerumque C. cornea similis. Long. $\frac{7}{8}$, alt $\frac{5}{8}$, lat. $\frac{1}{2}$ poll. Hab. N. S. Wales.

It is larger, more rounded in outline, and more globose in form than *C. cornea*. The epidermis is less glistening, of a deeper green, and exhibits no traces of radiations. The ligament is shorter and more prominent. The beaks hinge and furrowing, and nearly the same in both.

(Loc. cit. p. 293.)—*CYRENA DEBILIS*.

T. parva, tenuis, transverse ovata, postice ampliata et subtruncata, subæquilateralis, concentricè liris confertis subreflexis arata, epidermide nitido superne olivaceo induta, umbonibus parum elevatis, erosis, absque lunula, intus violaceo, albida; dentibus cardinalibus inconspicuis, dentibus lateralibus elongatis, striatis. Long. $\frac{6}{10}$, alt. $\frac{4}{10}$, lat. $\frac{1}{4}$ poll. Hab. New Holland?

Most like *C. pusilla*, but has no areola in front of the beaks, is less orbicular, and somewhat larger. In general, it resembles a *Cyclas*.

(Loc. cit. vol. 7, p. 139.)—*TORNATINA APICINA*.

T. minuta cylindracea, elongata, alba, lineis incrementi tenuissimis insculpta, apice mammilato; anfr. 4, sutura canaliculata. Apertura $\frac{3}{4}$ long. testæ, perangusta, plica columellari obsoleta, labro lateraliter viso arcuato. Axis 5 millim., diam. 2. Hab. Sydney Harbour, N. S. Wales.

The aperture is broader, and the pillar-fold less definite than *T. fusiformis*.

[Very questionable if distinct from the last named, and as I think not distinct from *T. brenleyii*. Angas Zool. Proc. 1877. J. E. T. W.]

(Loc. cit. p. 140.)—*CYLICHNA REGULARIS*.

T. satis magna, elliptica, elongata, alba, spiraliter insculpta, vertice obtuso, late perforato. Apertura perangusta, admodum antice ampliata, columella incrassata, vix incurvata, imperforata, ventre calloso. Axis 9, diam. 4 millim. Hab. Sydney Harbour, N. S. Wales.

[We have only one *Cylichna* in N. S. Wales, *C. arachis* Q. and G., which seems the same as this shell.—J. E. T. W.]

(Loc. cit. P. 163.)—*EMARGINULA (CLYPIDINA) RADIATA*.

T. cinerea, elliptica, costis radiantibus imbricatis ad 17, et costulis intermedianis ad 3 ornata, prope apicem acutum, deflectum, submedianum clathrata, intus viride radiata, margine denticulata, fissura curta, in canalem internum versus apicem producta. Long. 12, lat. 8, alt. 7, millim. Hab. Sydney Harbour, N. S. Wales.

[I doubt very much if this species is distinct from *Emarginula australis*, Lamk. J. E. T. W.]

(Loc. cit. p. 324.)—*RINGICULA DENTICULATA*.

T. ovata, acuminata, solida, lactea, striis confertis transversis, exilioribus (interdum intervenientibus) insculpta; anfr. 5, ventricosis, apertura angusta, labro admodum incrassato, intus denticulato fere ad sinum siphonalem interrupto; plicis acutis, transversis, callo modico, haud oppresso, dente parietali modico. Axis 5, diam. 3.5, millim. Hab. Port Jackson, N. S. Wales.

The numerous striæ, denticulate labrum, and scantiness of callus about the siphonal notch mark the species.

[We have two other species of the genus in N. S. Wales, both distinct from this. J. E. T. W.]

(Loc. cit. p. 238.)—*NASSARIA CURTA*.

T. parva, elongata, ovato rhomboidea, solidula, straminea, ante suturam pallidiori et fulvo maculata; anfr. 6, ventricosis, filis ad 8 volventibus, et plicis ad 15 longitud. ornatis. Apertura angusta ovalis, labro incrassato, intus denticulato, lamina columellari erecta, rostro modico, recto. Axis 10, diam. 6 millim. Hab. Port Jackson.

It is smaller than any species in the Cuming collection and has a short beak. It is like *N. carduus*, Reeve, but has serrate delicate waves.

(Loc. cit. p. 331.)—*NASSA REPOSTA*.

T. solida, ovato-conica, rudis, cinerea, plicis inconspicuis 12-14, demum carentibus, et filis remotis (superne 4) ornata; anfr. 7, convexis, postice subangulatis, apertura ampla, rotundato ovata, labro incrassato, expanso, intus denticulato, columella valde arcuata, lutea, vitrea, fauce fusco, rufo, postice luteo fasciata. Axis 12, diam. 7 mil. Hab. Sydney, N. S. W.

[This appears to be only one of the many varieties to which *Nassa pauperata*, Lamarck, is subject, to which also I am inclined to refer *N. Tasmanica, mihi*. Angas appears to have named the shell *N. labecula*, Zool. Proc., 1851. J. E. T. W.]

NASSA OPTATA.

T. subtenuis, ovata, conica, acuta, polita, albida, demum ferrugineo variegata; anfr. 7, convexiusculis, ad 12 plicatis, plicis ad anfr. ult. tandem carentibus, striis volventibus 5, quorum præsuturali profundiore gemmulas efformante secantibus; sutura profunda, apertura late ovalis labro intus lævi, extus incrassato, rufo, variegato; columella admodum callosa. Ax. 10, diam. 6 millim. Hab. Sydney Harbour.

Very closely resembles the figure of *N. Grayii*, Deshayes, of the *Icon. Conch.*, which, however, is believed to represent a larger and more ventricose shell than that of Kiener.

[This may be *N. rufocincta*, A. Adams, which, however, he states came from the Honduras, Port Jackson, and on all the N. S. W. coasts. J. E. T. W.]

(Loc. cit. p. 337.)—CLATHURELLA PEREGRINA.

T. avato-fusififormis solida, obscure fulva, plicis obtusis ad 18, filis transversis (ubi plicis decussantibus) ornata; anfr. 6, ventricosis. Aperture $\frac{2}{3}$ totius longitudinis lineata, postice rotundata, labro acuto, intus lamellato, canali brevi, angusto, abrupte incepto. Ax 12, diam. 5 millim. Hab. Sydney Harbour.

Closely allied to *C. assimilis*, but less colored, and the striæ less crowded.

[This shell is very common in Port Stephens, and appears to have been re-named lately in the Zool. Proc.)

(Loc. cit. p. 386.)—CERITHIUM LACERTINUM.

T. turrita fusiformis, tenuis, cinerea, fusco maculata; anfr. 10, convexiusculis, bene discretis, posticis plicatis, et filis granulosis 4, ad anfr. ult. demum simplicibus cinctis, minoribus plerumque intervenientibus. Apertura semilunaris, labro acuto, rostro abbreviato. Ax. 13, diam. 4 mill. Hab. Sydney Harbour.

Exceedingly like *C. lima* Brug. It has no varices, is less slender and differently colored. It is also like *C. granarium* Kiener.

[This is evidently *C. lawleyanum* of Crosse, which must give way to Gould's name. J. E. T. W.]

(Loc. cit. p. 409.)—RISSOINA FLEXUOSA.

T. fusiformi, turrita, straminea, anf. 7, convexiusculis, plicis obtusis, flexuosis circiter 15, clathratis et lineis volventibus numerosis cinctis, apertura satis magna, semicircularis, peritremate simplici expanso, antice effuso. Axis 6, diam. 2. Sydney Harbour.

[This shell is not known to me, but may have been redescribed amongst our numerous species of the genus. J. E. T. W.]

(Loc. cit. p. 407.)—CHEMNITZA CIRCUMDATA.

T. ovato-conica polita, straminea, vitta aurantacea cincta, anfr. 8, convexis et sutura vix indicatis, posticis, plicis numerosis indistinctis ornatis, ultimo haud insculpto, et vittis 5 ornato. Apertura angusta, peritremate acuto. Ax. 5, diam. 2 millim. Hab. Sydney Harbour.

MONILEA APICINA (Loc. cit. vol. 8, p. 15.)

T. parva ovato-conica, tenuis, filis numerosis subæqualibus cincta, apice flammulis sparsis, radiantibus rosaceis; anfr. 5, convexiusculis ad peripheriam obtusis; sutura profunda, basi convexa, lineis incrementi nonnihil granulatis; umbilico minuto, costa callosa et altera interiori cincto; apertura fere circularis. Axis 5, diam. 6 millim. Hab. Port Jackson.

[This certainly seems to be one of the *Monileæ* of E. Australia, probably *M. australis*? of Angas.]

CLANCULUS JUCUNDUS.

*T. parvula depressa, ovato-conica, ochracea, vel rufescens; anfr. 5, convexis, prope suturum tesselatis, interdum omnino strigatis; lineis inæqualibus cinctis, ad anfr. maj. gemmatis; sutura canaliculata; basi rotundata, umbilico crenulato, dente columellari eminente, acuto; labro intus sulcato. Axis et diam., 5 mil. Hab. Sydney, N. S. W. About the size of *C. minor*.*

[This diagnosis is very general, and really would apply to many of our N. S. W. species. It would be difficult to determine it without seeing the type.—J. E. T. W.]

ELENCHUS OCELLATUS.

*T. parva elevata, ovato-conica, polita, postice ex rufo virescens; antice rubescens, lineis volventibus pallidis rufo-marginatis circiter 4, et lineis flexuosis obliquis ornata; anfr. 7, vix convexis, punctis albis circiter 6 cinctis, ultimo ad peripheriam obtuse angulato; basi convexa, apertura ovata, intus virescens, columella pallida, dente obsoleto albido instructo. Axis 12, diam. 7. Hab. Sydney, N. S. Wales. Allied to *E. minor*.*

ELENCHUS EXIGUUS.

T. minuta, levis, ovato-conica acuta, flavida, rosacea vel fulvida, plus minusve lineis saturationibus vel vittis articulatis ornata; anfr. 5, ventricosis, apertura rotundato-ovata, columella planata, decolorata, dente acuto, deflecto, minuto. Axis 2, diam. 1.5. Hab. Port Jackson.

CANTHARIDUS LINEOLARIS.

T. elevato-conica, perforata, aureo-viridis lineis angulatis luteis prope suturum dilatatis, ibi nigro maculatis, striis incrementi et striis volventibus subtilissimis reticulata; anfr. 7, planulatis, ultimo angulato, apertura parva, subtriangularis. Axis 7, diam. 4. Hab. Sydney, N. S. W.

THRACIA CULTRATA.

T. parva, alba, tenuissima, ovato-rhomboidea, ventricosa, intus argentata antice semi-elliptica, late rotundata, umbonibus post medianis, acutis, margine dorsali posteriore, declivi, extremitate truncata; angulo superiori acuto, declivitate umbonali acuta; margine ventralis vix arcuata; apophysi cardinali triangulari (Valva sinistra ignota.) Long. 8, alt. 6, lat. 4. Hab. Port Jackson, sandy mud, 8 to 15 fathoms.

LEPTON CONCENTRICUM.

T. ovato-triangularis, subplana concentrice concinne lirata (liris acutis) epidermide subrugosa marginem implicante induta: umbonibus post medianis acutis; cicatricibus subelongatis, linea pallii emargine remota, dentibus minimis lateralibus utraque valva remotis, fere obsoletis; valvæ dextræ dente cardinali unico; v. sinistrae dentibus duobus minimis margini contiguus. Long. 10, lat. 4, alt. 7. Hab. Sydney Harbour.

This beautiful species is easily known by its minute teeth, concentric sculpture, and abundant epidermis. Its shape is unusually unsymmetrical, and not unlikely it belongs to a genus not yet established.

KELLIA BALAUSTINA.

T. minuta nitida rotundato-ovata, rubiginosa, subdiaphana, lineis concentricis creberrime inculpta, umbonibus submedianis eminen-

tibus, margine ventrali valde arcuata, marginibus cardinalibus rubidis, valvæ alteræ dentibus card. 2, parvis, dentibus lateralibus brevissimis, postico fere obsoleto, valvæ alteræ dentibus lateralibus curtis, antico obsoleto, dente cardinali, univalido. Long. 2·5, alt. 2 mil. Hab. Sydney Harbour.

MODIOLARIA VARICOSA.

T. tenuis-compressa, ovato-trapezoidalis, dilute viridis, lineis fuscis angulatis ornata, umbonibus terminalibus, extremitate antica acuta, marginibus arcuatis, divergentibus, extremitate postica rotundata, arcis lateralibus striis frequentibus radiantibus impressis; area mediana striis concentricis vel etiam striis radiantibus solum insculpta; pagina interior nacrea, lineis angulatis rufis perlucen-tibus. Long. 9, alt. 6, lat 2·5 mill. Hab. Sydney Harbor.

EMARGINULA ASPERA.—(Loc. cit. vol. II., p. 154.)

T. parva tenuis, depresso-conica, fuliginosa, costis elevatis, quad-ratis plerumque duplicibus ad 10, albidis, ad intervalles striis crebris decussantibus exasperatis vertice subcentrali, acuto, recurvo, intus glauca, albido radiante margine denticulato, incisura angusta, profunda, intus in canalem versus apicem producta. Long $\frac{1}{5}$, lat. $\frac{1}{2}$, alt. $\frac{1}{2}$ poll. Hab. Sydney. Much like *E. rugosa*, Quoy and G. in size and form, but differing in color, sculpture, and the larger size of the notch.

EMARGINULA OSSEA.

Is described as from the Fiji Islands, and was identified with *Tugalea Tenisoni*, nobis, but Dr. Gould distinctly says his shell is thick and coarse and allied to *Emarginula australis* Lam., while the Australian and Tasmanian shell is fine, thin and depressed.

I have only to add that I have not interfered with Dr. Gould's Latin. This eminent naturalist it will be seen took many liberties with the classic language.
